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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CROW, ROBERT THOMAS

ART UNIT	PAPER NUMBER
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1634

NOTIFICATION DATE	DELIVERY MODE
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08/21/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/526,402	KIM ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 3,4 and 9-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/05; 11/05</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I in the reply filed on 20 June 2007 is acknowledged. The traversal is on the ground(s) that each claim shares the present biochip, and thus share the same or corresponding special technical feature. This is not found persuasive because, as stated in the Requirement for Restriction Election filed 23 May 2007, Taylor et al disclose a biochip having gel type spots. Therefore, the technical feature linking the inventions of Groups I-IV does not constitute a special technical feature as defined by PCT Rule 13.2 as it does not define a contribution over the prior art.

The requirement is still deemed proper and is therefore made FINAL.

Claims 3-4 and 9-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 20 June 2007.

Claims 1-2 and 5-8 are under prosecution.

Claim Objections

2. Claim 1 is objected to because of the following informalities: claim 1 appears to be a machine translation of a foreign language and thus contains grammatical errors, including "a gel type of spots" and "and encapsulated by spot." Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-2 and 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2 are indefinite in claim 1, which recites each of the following:

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A. The recitation "a gel type of spot are integrated" in line 1 of claim 1. The term "are integrated" renders the claim indefinite because it is unclear if the spots are integrated with each other to form a continuous hydrogel layer or if the spots are integrated with the substrate.

B. The recitation "entrapped in pores therein" in line 2 of the claim. The placement of the phrase "entrapped in pores therein" after the phrase "chip substrate" makes it unclear if the pores are in the gel or in the substrate itself.

Claim 7 is indefinite in the recitation "copolymers" at the end of the claim. It is unclear if "copolymers" refers only to cyclic olefins. It is suggested that the claim be amended to clarify whether or not each of the members of the group is required to be a copolymer.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor et al (PCT International Application Publication No. WO 99/36576)

Regarding claim 1, Taylor et al teach a biochip. In a single exemplary embodiment, Taylor et al teach a biochip having gel type of spots; namely, an array of gel pads on a support having nucleic acid strands immobilized within the pores of the gel matrix (page 2, line 34-page 3, line 3). The gel pads are deposited (i.e., as spots) on the array (page 25, lines 20-35). Biomaterials in the form of DNA are then entrapped within the gel (page 2, lines 4-17), and are thus encapsulated by spot

Regarding claim 2, Taylor et al teach the biochip of claim 1, which is used as a DNA chip; namely, DNA is entrapped within the gel (page 2, lines 4-17).

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In addition, it is noted that the courts have held that "while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). In addition, "[A]pparatus claims cover what a device *is*, not what a device *does*." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). Therefore, the various uses recited in claim 2 (e.g., use as a DNA chip) fail to define additional structural elements to the device of claim 1. Because Taylor et al teach the structural elements of claim 1, claim 2 is also anticipated by Taylor et al. See MPEP § 2114.

7. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Stengele et al (U.S. Patent Application Publication No. US 2002/0053508 A1, published 9 May 2002).

Regarding claim 1, Stengele et al teach a biochip. In a single exemplary embodiment, Stengele et al teach a substrate surface having immobilized oligonucleotides thereon (paragraph 0010), wherein the immobilized oligonucleotides are produced by photolithography (paragraph 0018). Photolithography produces spots of oligonucleotides, and oligonucleotides are biomaterials. Because the gel layer is placed on top of the immobilized oligonucleotides (paragraph 0010), the spots of photolithographically produced oligonucleotides are a gel type of spot and the oligonucleotide biomaterials are encapsulated at each (i.e., by) spot.

It is noted that *In re Best* (195 USPQ 430) and *In re Fitzgerald* (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter which there is reason to believe includes functions that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph). In the instant case, the gels of Stengele et al are interpreted as porous. Therefore, because the porous gel is layer on top of

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the immobilized oligonucleotides (paragraph 0010), the biomolecules become entrapped in the pores therein.

Regarding claim 2, Stengele et al teach the biochip of claim 1, which is used as a DNA chip; namely, a DNA produced (Abstract).

As noted above, apparatus claims cover what a device *is*, not what a device *does*. Therefore, the various uses recited in claim 2 (e.g., use as a DNA chip) fail to define additional structural elements to the device of claim 1. Because Stengele et al teach the structural elements of claim 1, claim 2 is also anticipated by Stengele et al.

Regarding claim 5, Stengele et al teach a chip substrate. In a single exemplary embodiment, Stengele et al teach a substrate coated with a polymer gel (paragraph 0021), wherein said polymer gel is polyvinyl acetate (paragraph 0013) having a molecular weight in the range of 800 to 200,000; namely, 170,000 (Example 3). Stengele et al also teach the polymer is dissolved in the solvent methanol; namely, the polymer is 40% by weight (paragraph 0011) and the remaining 60% of the weight of the solution is a 33.33% mixture of the solvent methanol in water (paragraph 0014). The final weight percent of the solvent methanol is 20%, and the remaining balance is water. The conditions are thus in accordance with the embodiment described on page 6 of the instant specification, wherein the solvent is an organic solvent having a low boiling point (i.e., methanol), and is 20% of the weight of the total coating solution. It is noted that the specification does not describe any limitations regarding what substances may or may not constitute the remaining weight of the coating solution. Therefore, the remaining balance of water is not prohibited by the specification.

Regarding claim 6, Stengele et al teach the chip substrate of claim 5, wherein the coating is performed by spin coating (paragraph 0021).

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Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stengele et al (U.S. Patent Application Publication No. US 2002/0053508 A1, published 9 May 2002) in view of Pfeifer (U.S. Patent No. 4,680,195, issued 14 July 1987).

It is noted that while claims 5-6 have been broadly rejected under 35 USC 102(b) as described above in Section 7, the claim is also obvious using the more narrow interpretation outlined below.

Regarding claim 5, Stengele et al teach a chip substrate. In a single exemplary embodiment, Stengele et al teach a substrate coated with a polymer gel (paragraph 0021), wherein said polymer gel is polyvinyl acetate (paragraph 0013) having a molecular weight in the range of 800 to 200,000; namely, 170,000 (Example 3). Stengele et al also teach the polymer is dissolved in a polar aprotic solvent (paragraph 0010). Thus, the prior art of Stengele et al teaches the "base" device of a chip substrate coated with a gel coating solution of polyvinyl acetate having a molecular weight of 170,000 dissolved in polar

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aprotic solutions. Stengele et al do not explicitly teach the technique of coating the substrate with polymers dissolved in the solvents methylene chloride, tetrahydrofuran, ethyl acetate, or mixtures thereof.

However, Pfeifer teaches coated materials (i.e., substrates) that are coated with polymers dissolved in polar aprotic solvents including the solvents methylene chloride, tetrahydrofuran, ethyl acetate and mixtures thereof (column 32, lines 1-25). Thus, the prior art of Pfeifer teaches the technique of coating materials with solutions of dissolved polymers in the solvents tetrahydrofuran, methylene chloride, or ethyl acetate, or mixtures thereof for the purpose of the predictable result of providing a coated material; and is thus applicable to the base coating method of Stengele et al.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made that applying the known technique of using a coating solution of dissolved polymers in the solvents tetrahydrofuran, methylene chloride, ethyl acetate, or mixtures thereof as taught by Pfeifer would have yielded the predictable result of coating the chip substrate of Stengele et al. Claim 5 is therefore obvious over the teachings of Stengele et al in view of Pfeifer because a person of ordinary skill in the art would have recognized that application of the known technique of Pfeifer would have predictable coated the chip substrate of Stengele et al.

Regarding claim 6, the chip substrate of claim 5 is discussed above. Stengele et al also teach the coating is performed by spin coating (paragraph 0021).

11. Claims 5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stengele et al (U.S. Patent Application Publication No. US 2002/0053508 A1, published 9 May 2002) in view of Simon et al (U.S. Patent No 5,569,607, issued 29 October 1996).

It is noted that while claim 5 has been broadly rejected under 35 USC 102(b) as described above in Section 7, the claim is also obvious using the more narrow interpretation outlined below.

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Regarding claims 7-8, Stengele et al teach a chip substrate of claim 5 (as presented in Section 7 above). In a single exemplary embodiment, Stengele et al teach a substrate coated with a polymer gel (paragraph 0021), wherein said polymer gel is polyvinyl acetate (paragraph 0013) having a molecular weight in the range of 800 to 200,000; namely, 170,000 (Example 3). Stengele et al also teach the polymer is dissolved in the solvent methanol; namely, the polymer is 40% by weight (paragraph 0011) and the remaining 60% of the weight of the solution is a 33.33% mixture of the solvent methanol in water (paragraph 0014). The final weight percent of the solvent methanol is 20%, and the remaining balance is water. The conditions are thus in accordance with the embodiment described on page 6 of the instant specification, wherein the solvent is an organic solvent having a low boiling point (i.e., methanol), and is 20% of the weight of the total coating solution. It is noted that the specification does not describe any limitations regarding what substances may or may not constitute the remaining weight of the coating solution. Therefore, the remaining balance of water is not prohibited by the specification.

Stengele et al do not explicitly teach a polycarbonate substrate (i.e., claim 7) having a slide shape (i.e., claim 8).

However, Simon et al teach a slide shape made of polycarbonate, which has the added advantage of being made by plastic injection molding, thereby producing a precision slide by simple manufacturing techniques (column 1, line 59-column 2, line 10).

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the chip substrate as taught by Stengele et al with the substrate of Simon et al with a reasonable expectation of success. The modification would result in a polycarbonate substrate (i.e., claim 7) having a slide shape (i.e., claim 8). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a chip substrate having the added advantage of having a precision slide made by simple manufacturing techniques as explicitly taught by Simon et al (column 1, line 59-column 2, line 10).

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12. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stengele et al (U.S. Patent Application Publication No. US 2002/0053508 A1, published 9 May 2002) in view of Pfeifer (U.S. Patent No. 4,680,195, issued 14 July 1987) as applied to claim 5 above, and further in view of Simon et al (U.S. Patent No 5,569,607, issued 29 October 1996).

Regarding claims 7-8, the chip substrate of claim 5 is discussed above in Section 10.

Neither Stengele et al nor Pfeifer explicitly teach a polycarbonate substrate (i.e., claim 7) having a slide shape (i.e., claim 8).

However, Simon et al teach a slide shape made of polycarbonate, which has the added advantage of being made by plastic injection molding, thereby producing a precision slide by simple manufacturing techniques (column 1, line 59-column 2, line 10).

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the chip substrate as taught by Stengele et al in view of Pfeifer with the substrate of Simon et al with a reasonable expectation of success. The modification would result in a polycarbonate substrate (i.e., claim 7) having a slide shape (i.e., claim 8). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a chip substrate having the added advantage of having a precision slide made by simple manufacturing techniques as explicitly taught by Simon et al (column 1, line 59-column 2, line 10).

Conclusion


13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571) 272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


JEHANNE SITTON
PRIMARY EXAMINER
8/16/07

Robert T. Crow
Examiner
Art Unit 1634

